Research on Security Incident Analysis: Scenarios and Challenges

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Abstract: This paper systematically reviews the research of safety analysis, which includes the detection of adverse events, the prediction of events, and the discovery of potential safety hazards. It mainly reviews the three aspects that are suitable for people's lives, namely, facility safety, complete medical care, and the prediction of the Internet of things. This study intends to analyze from the following dimensions: describing the current safety accidents in people's lives and their potential hazards; how to predict the possibility of crisis; summarizing the methods proposed in the literature. In addition, the limitations of the literature have been summed up: the prediction method mentioned in this paper needs to be improved in a few aspects, which means that might not meet the needs of some special cases; the prediction accuracy of logistics needs to be improved; the error in medical treatment is difficult to avoid. This review has certain theoretical and practical significance. To be theoretically speaking, relevant scholars are enabled to have a systematic understanding of security analysis and help them to formulate the future research agenda. From reality, practitioners can systematically understand the methods of safety detection and prediction, to formulate corresponding preventive measures and emergency plans.

1 INTRODUCTION

In the history of human development, the surging development of technology and science ensure many aspects of people's life. People's travel and the products that they use are all the outputs of the development of them. Meanwhile, in our daily life, the security of facilities also attracted people's attention. During the process of using innovations, people are more inclined to how to correctly use the security facilities with higher efficiency at the same time. There are a lot of existing literates on facilities and safety prediction. Several articles are summarized which are widely used in different fields so that practitioners or scholars can understand the significance of the safety field and the impact of it in the future, as well as the benefits of ensuring the safety of facilities to the development of human society, however, there is no relevant literature review. Therefore, the objective of this paper is to systematically review the research of safety analysis, in which safety analysis includes the detection of adverse events, event prediction and the discovery of safety hazards. This study intends to analyze from the following dimensions: firstly, describing the current safety accidents in people's lives and their potential hazards; second, how to predict the possibility of crisis and the methods proposed in the cited literature; third, the potential significance of this paper. This review article mainly focuses on event security, information prediction and the Internet of Things based on historical data, including the fields of medical and facility security, then the way of predicting the possibility of the event that people avoiding to let it happen based on the given information. The purpose of this event is attributed to the field of analysis, which includes the current situation of the event and the prediction of the probability of an accident in the future. This paper introduces examples of event safety in different fields. Besides, the technology that can be used in the process of forecasting, the mathematical calculation based on the historical model, and what needs to be improved in selected articles have also been focused on.

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This review has several theoretical and practical implications. From a theoretical point of view, it can enable relevant scholars to have a systematic understanding of safety analysis and help them to shape future research agendas. From a practical point of view, practitioners can systematically understand the methods of safety detection and prediction so as to formulate corresponding preventive measures and emergency plans.

2 METHODS AND RESULTS

2.1 Search Strategy

The purpose of this paper is to help people predict events more reasonably. So, to choose articles about facilities and the Internet of things, most of the previous articles are about medicine. Therefore, in order to avoid paying too much attention to the medical field, the articles at the bottom of the article list are excluded. The main sources of articles are Google, Google Scholar, and school libraries. After searching for keywords like Event Prediction, Event Security, Event Detection, and Facility Prediction, the most relevant articles with a preference for the number of references are collected. Eventually, articles about medical, facilities and IoT were obtained.

2.2 Security Analysis in Public Facility Scenarios

To create a comfortable, reasonable, and safe living environment for residents with an effective plan of development of the country, decision-makers have to work hard to come up with better solutions to achieve this goal. This part briefly introduces three kinds of daily life scenarios which need to be guaranteed safety and the technology applied in this paper, furthermore, a wireless sensor application technology is also explained. Those methods are used to provide reference ideas for decision-makers.

2.2.1 Event Detection in the Crowded Video

Most of the dangerous emergencies occur in the crowd which prone to the crowded dangerous situation in real life (Ke 2007). So to ensure people's safety, this paper provides some methods to detect dangerous events by using the video of the technology. But this method also has some errors. For example, first, the tracker is often affected by the noise of the environment; second, the 2D modeling has a similar disadvantage - it can't capture some motions and objects; third, the model is built manually and is derived from a single sample of events, thus it is impossible to predict the change of events, some problems are not involved in this model. The experimental process of this method will be described in the following paragraph.

This experiment takes the object being tracked as a speck, based on observations detection of the distance between the position of it and the spot. Further, the event which has spatial interaction activities are classified with training vertical and horizontal vectors, processing the sequence in the video. In this method, the volume of video space is a 3D object, so that different objects in the video can be distinguished - the object in events produce different shapes. The next step is shape matching which is used to identify events to detect the distance. This algorithm needs to set a minimum threshold, using sliding window detection technology to keep the error rate as less as possible.

Another way is to use unsupervised clustering technology to extract the contour of spatial shape model in the video, that is used to segment objects and backgrounds, besides, the background might have Optical Flow often makes noise which often causes errors. The model build in this method is combined with Shechtman and Irani's Flow Consistency method (Ke 2007), which is a complementary feature, so it can be calculated corresponding functions in the complex environment with graph and ground separation, to reduce the interference. To match and recognize between objects and the model, the author introduces a baseline matching algorithm of volume shape matching model based on parts so that the method organizes the part model into a tree structure and models the relative position of each part as a Gaussian distribution with diagonal covariance matrix to improve the matching efficiency.

The event is detected in the shape model of time and space in this method, demonstrating how to do shape matching in a cluttered scene with dynamic background, and it complements the previous dynamic description to calculate in the complex environment so that it can be extended to 3D for event recognition. This technology realizes low precision and recalls near all actions, and the behavior based on the part shape and description flow is better than previous studies, which shows the powerful performance of the recorded video.

2.2.2 Smart City

With the development of the times, the impact of computing public infrastructure on the smart city is crucial, such as supermarkets, hospitals, office space, to meet the different needs of people. These affect people's way of life, at the same time, the vehicles people drive will also affect the changes in the facilities, for example, traffic flow at different times. Using sensor technology to obtain the movement mode in space can find the problems faced by the city and provide a new perspective to overview the modern city, so that helps the city planners make more reasonable decisions. There are two challenges at the beginning (Wang, et al. 2016): the first is how to effectively calculate the influence degree when the data is a large number of vehicles and facilities; the second is how to predict the influence when the current position of vehicles is known. Based on these two aspects, the experiment uses the following methods to achieve the goal.

This article (Wang, et al. 2016) using a network (grid) index method is to map the position of a vehicle to a specific unit. In this unit, the number of vehicles will be added to the area which is the nearest facility around it. That means although each vehicle has its trace, when the tracks of the two cars are similar, the destination that they are going to is homologous. So a model based on the Markov Chain is used, which is one of the various versions of it, that can be learned through the historical trail. This model predicts the movement of vehicles in the following days so that designers can get the range of more, it is used to change and update the planning of future facilities.

Index method of the grid. It is a kind of grid that divides the geographical area into the same size and provides an index for each grid. Trace can be replaced by a grid, which is represented by an index in the grid. In this model, the scope and coverage of different facilities are different due to the size, so the number of grids covered by it is also variance. The number of taxis in the grid and then get the impact of this facility on the city based on the qualities of each facility are calculated. Although this method seems remarkably simple, there may be facilities crossing range that reflect the nearby grid. And the size of grid selection also affects the distribution of future devices to a certain extent. However, this method also has advantages, it can be used to predict the impact of facilities management, meanwhile can also avoid many issues, such as traffic jams, furthermore, it can solve data separately in predicting future location.

The previous Markov model uses the way of transferring the state of each grid to the matrix, and its working rate is trained by the number of historical steps of movements which means this method is changing the data from one unit to the corresponding matrix. Besides, the number of transferring efficiency is used for the transition probability between two units. The basic Markov model is to predict unknown traces. Another situation is that if the traces are known, the Bayesian theorem can help to calculate the probability of these objects will go to the destination (Wang, et al. 2016).

This experiment provides how to predict the influence degree of facilities in the smart city according to the traffic flow and predict the future movement through grid division and historical training model. Although the prediction location may introduce uncertainty and affect the prediction results, as long as the distance between the prediction grid and the actual distance is not far, and around the same public facilities, the impact is small. The influence and precision of the experiment are acceptable. So, people can use the method mentioned in the article to predict a public facility to meet people's needs for urban life.

2.2.3 High Voltage Transmission System

People's daily life is inseparable from the voltage system. To maintain continuous supply, High Voltage Transmission Systems (HVTS) need to be maintained reliably (Jaya 2019). Because the system failure will lead to huge economic losses, but also endanger people's lives and use. Therefore, in the process of maintenance, the safety of a high voltage transmission system is of great significance in the real scene. This paper introduces the safety assessment and control of the voltage system. According to the failure rate of a historical model, the possibility of future failure is predicted, besides, the accuracy of this method is as high as 89.88%. Next, the implementation of this method will be focused on.

This experiment (Jaya 2019) applies a kind of K-neural network technology which is a simple and efficient way to be used in object recognition. So, in various searching for research, it is common to use for prediction. One of the main methods is that K-and can be used to classify and evaluate by decision trees, discriminant analysis, and logistic regression. This function offers active training and searching for the best classification model which has almost 90% accuracy, but the speed is at a medium level around all the functions of finding. The method adapts various metrics to determine the distance, according to the given set 'X' of 'n' points, the KNN nearest searching can help to find the point which is closest to the target in X. This way is widely used in machine learning. In check the safety of the facility, there will be less time on finding the place that needs to be repaired.

To predict events, the more mistake made, the less efficiency people will have. Thus, the correct range of calculating is important. One of the solutions is that using the failure rate of the power system which can be expressed by Gaussian function by using a fuzzy security index binary- the least square method. And this way is to find the state of keeping the facility run normally.

$$\mu_{a^i}(x) = \exp -(\frac{(e_i - x)^2}{2\sigma_i^2}) \quad (1)$$

In general, this method uses the Markov model which is divided into 16 states for modeling and is divided into five security levels. The accuracy of prediction is determined by Safety Index. The conclusion of the experiment is according to the exception and the prediction is accurate. Through this method, this method can be applied to more facility's safety prediction to ensure the safety of the staff.

2.2.4 Wireless Technology

Wireless sensor technology is used for detection and prediction. At the same time, this paper (Zhong, et al. 2015) demonstrates that sound is predictable, and introduces a fuzzy logic system based on the sound signal that can be a prediction. Also, a double sliding window detection model is applied to reduce the error.

Wireless sensors can monitor machine facilities. If the sound increases abnormally, it indicates that the machine may appear some mistakes, this can be seen as an event. So, machines can be check and predicted by the wireless sensor with sound signals.

Variance time chart is widely used in verifying the time series. The common character of the sound signal is automorphism, which is the principle of the following method adapted by the author. So, this way can be applied to the prediction. A fuzzy logic system is also a kind of time series prediction that can be used to calculate intensive time. It can capture the characteristics of the sound signal made by the machine, which means that it can be predicted by historical behavior and then check. For the potential application of prediction of the sound signal, in this paper, a new algorithm applying for reducing errors of event detection - 'double sliding window event detection' is proposed, this method is used to regulate noise range in the uncontrollable environment and determine a fixed threshold of different surroundings. To alleviate the problem of a range selection.

The method (Zhong, et al. 2015) is superior to the historical model. Through the signal-to-noise ratio and self-discipline of sound, besides, the error is reduced by using the time variance model - fuzzy logic system and double sliding window detection. The experiment proves that the wireless sensor can be used to predict and detect the related security after simulating the related experiment models.

2.3 Sequential Prediction on IoT Scenarios

Nowadays, the Internet of Things (IoT) is becoming more and more important in our life. The number of devices connected to the IoT will reach 26 billion devices by 2020, according to Gartner Group. The Internet of things is the inevitable trend of this era. In this part, the prediction of IoT will be discussed. Due to the characteristics of the Internet of things in time and space, the prediction of IoT will be necessary. There are two kinds of prediction of IoT to discuss. The first prediction used Bayesian Network and association rules to predict associated events and the second prediction used clustering and event detection in social streams to do some predictions.

This part uses two algorithms to do some sequential predictions on IoT. This sequential prediction will be particularly useful in IoT. It can predict delays in one transport phase provides sufficient time for rescheduling activities in the next and some goods that the user wants to buy can also be predicted according to some of his shopping records or logistics records and can also be predicted through some purchase records of other users.

2.3.1 Bayesian Networks

Literature adopts a Bayesian network, which is used to build a model with uncertainty (Karakostas 2016). It is a directed acyclic graph, and each of its nodes represents a discrete random variable. There is a causal relationship between the variables represented by its child node and those represented by its parent node. The edge between two nodes represents the probability dependence between events.

e_2->e_1: means the possibility of e_1 depends on e2, P (e_2)! = 0.

$$P(A|B) = \frac{P(A)P(B|A)}{P(B)} \quad (2)$$

In this case, it is assumed that event B is fixed, that is,$P(B) = 1$. The impact of the determined event B on event A is needed to be considered.

$$P(e_2|e_1) = \frac{p_h(e_2) * p(e_1|e_2)}{p(e_1)} \quad (3)$$

Suppose that e_1 and e_2 are two potential causal objects. This causality determines the subsequent events triggered by the event generated by the object. Statistical knowledge will be used to build a conditional probability model and use the Bayesian formula to give the above formula.

$$P(e_2|e_1) = p_h(e_2) * p(e_1|e_2) \tag{4}$$

$p_h(e_2)$ is the probability of observing E2 independently of other events, P (e_1 - e_2) is the influence intensity of e_1 on e_2 probability. If E1 is assumed to be P（e_1） = 1, the above formula is obtained

Since some events can cause a chain reaction, some events can be decomposed. For example, event e can produce chain reactions $e_1, e_2, e_3, ..., e_n$. These n intermediate events are linked to calculate the probability of e_n's dependence on event e .

P (e_n | e_{n-1}) is calculated the conditional probability of $P(e_2|e_1)$.

2.3.2 Association Rules

Literature also adopts *association rules* (Rudin, et al. 2011), and the idea of the algorithm is as follows.

Algorithm 1: Subroutine GenRules.

- Input: (S, B, X), that is, past orders S = {zi}i=1,...,m, zi ⊆ X , current basket B ⊂ X , set of items X

- Output: Set of all rules $\{aj \rightarrow bj\}j$ where bj is a single item that is not in basket B, and where aj is either a subset of items in basket B, or else it is the empty set. Also, the left-hand side aj must be allowed (meaning it is in A). That is, output rules {aj → bj}j such that bj ∈ X \B and aj ⊆ B ⊂ X with aj ∈ A, or aj = ∅.

Algorithm 2: Max Confidence, Min Support Algorithm

- Input: (θ, X , S, B, GenRules, c), that is, minimum threshold parameter θ, set of items X , past orders S = {zi}i=1,...,m, zi ⊆ X , current basket B ⊂ X , GenRules generates candidate rules GenRules (S, B, X) = {aj → bj}j , number of recommendations c ≥ 1

- Output: Recommendation List, which is a subset of c items in X

- Flow of the algorithm：

a) Apply GenRules (S, B, X) to get rules {aj → bj}j where aj is in the basket B and bj is not.

b) Compute score for each rule aj → bj as ¯fS,θ (aj , bj) = fS,0 (aj , bj) = # (aj∪bj) #aj when support #aj ≥ θ, and ¯fS,θ (aj , bj) = 0 otherwise.

c) Reorder rules by decreasing score.

d) Find the top c rules with distinct right-hand sides, and let Recommendation List be the right-hand sides of these rules

Algorithm 3: Adjusted Confidence Algorithm.

- Input: (K, X , S, B, GenRules, c), that is, parameter K, set of items X , past orders S = {zi}i=1,...,m, zi ⊆ X , current basket B ⊂ X , GenRules generates candidate rules GenRules (S, B, X) = {aj → bj}j , number of recommendations c ≥ 1

- Output: Recommendation List, which is a subset of c items in X

- Flow of the algorithm：

a) Apply GenRules (S, B, X) to get rules {aj → bj}j where aj is in the basket B and bj is not.

b) Compute adjusted confidence of each rule aj → bj as fS,K (aj , bj) = # (aj∪bj) #aj+K .

c) Reorder rules by decreasing adjusted confidence.

d) Find the top c rules with disti

2.3.3 General Architecture of IoT Prediction

This diagram is the general architecture of IoT prediction. Different events are generated by the IoT cloud and stored through the capture interface supporting the M2M protocol of the typical IoT. In the storage warehouse, events are cleaned up and classified, and then the category probability of events is calculated according to the above model. Since new events are added to the warehouse periodically, the probability is recalculated periodically. The time prediction model is connected with the decision support system.

2.4 Clinical Predictive Models in Medical Scenarios

As medical equipment plays a more and more important role in modern hospitals, the safety detection and development of medical equipment has become an important link in hospital management. Different medical devices play different roles depending on the severity of the disease. Some of the devices are just adjunct to treatment and health care, while most of the devices are lifesaving. Take dialysis equipment for example. The patient's life is supported by it. More than 350,000 patients receive dialysis in the United States, and the safety of their care is ultimately the responsibility of the medical director of the facility. Dialysis facilities are a complex organization that involves multiple disciplinary providers and uses advanced technologies to care for patients with a wide range of serious diseases. As organizations become more complex and the likelihood of errors increases, potential risks must be identified and prioritized. To investigate the attitudes of dialysis patients and health care providers toward safety through a randomized national review of dialysis patient data. According to the findings, safety risks mainly come from patient safety hazards (such as communication or machine design), dialysis equipment failures, and medication errors.

Improve and change health care safety through the use of QAPI programs. A successful QAPI program requires a reliable collection and rigorous analysis of data. One widely accepted form is the plan-dot-check-action cycle. This approach first "plans" the required process improvements with the available data and literature, and then implements those improvements ("do"). Evaluate the results to determine whether performance has improved (the "check"). If the results improve, the results are shared and the new process ("act") is implemented across the organization, and the results are re-validated to ensure that the improvements are effective and ongoing. If the expected results are not met, alternative or additional improvements must be planned and implemented, and the results reanalyzed.

In order to provide effective outcome prediction for patients and provide a good basis for treatment decisions, clinical prediction plays a very important role. Clinical predictive models play an important role in medical decision-making, such as risk stratification and treatment allocation. Their effectiveness needs to be tested systematically in large scale trials. They have developed a dynamic clinical prediction model with discrete time to event data with competitive risk, and they extended standard objective Bayesian variable selection methods to address discrete-time competitive risk models and identified the most relevant predictors of ventilator-associated pneumonia (VAP) caused by a specific microbe, Pseudomonas aeruginosa (PA).

By studying the competitive events between pneumoviruses to provide more effective pr-0ediction and a good basis for new patients. Data on new patients from different periods and patients from different centers were obtained by recording 5123 days of intensive care units. This study uses the Bayesian variable (discrete data processing) selection method to deal with the discrete-time competition risk model. The discrete-time event models are collectively called logistic regression.

$$\delta_i = \begin{cases} 1 & T_i \leq C_i \\ 0 & T_i > C_i \end{cases}$$

$$\lambda_r(t|x_{it}) = \Pr(T_i = t, R_i = r | T_i \geq t, x_{it})$$

$$= \frac{e^{\beta_{0tr} + x_{it}^T \beta_r}}{1 + \sum_{j=1}^{m} e^{\beta_{0tj} + x_{it}^T \beta_j}}, \text{for } r = 1, \ldots, m, t = 1,2, \ldots, \quad (5)$$

Table 1: Summary findings of Renal Physicians Association health and safety surveys.

Safety Issues during the Prior 3 Months	**Professional Staff Response (%)**	**Patient Response (%)**
Patients worried or concerned about safety/staff	Patients communicated concerns sometimes or always: 63	Sometimes or always worried: 49
Ease of communication	Easy to communicate with patients: 94	Uncomfortable / somewhat uncomfortable communicating with staff: 18
BP or weight not recorded prior to dialysis	Happened sometimes: 13	Happened sometimes: 10
Mistakes in membrane or bath set up	Happened sometimes: 60	Happened sometimes: 6
Lapses in infection control (hand hygiene)	Reported event occurred: 27	Reported event occurred: 11
Medication errors	Missed or incorrect dose occurred sometimes: 23	Always discuss all medications with staff: 23
Difficulty with access to needles	Rare or no difficulty inserting: 66	Pain at access site during treatment: 39
Prolonged access to bleeding	Sometimes: 15	Sometimes: 23
Needle dislodgement prior to the end of treatment	Sometimes occurred: 4	Reported event occurred: 5
Medical mistakes in prior 3 months	Reported no events occurred: 70	Reported no events occurred: 73
Used with permission from the RPA Health and Safety Survey		

However, once ventilator-assisted or extubated patients died during the trial, they were no longer at risk of VAP hypertension. In addition to discrimination, another important aspect of prediction model evaluation is calibration, which informs the reliability of the forecast risk. Calibration performance will be evaluated using a calibration diagram (CP) and calibration slope (CS) and intercept (CI).

$$\log\left(\frac{\lambda_r(t|x_{it})}{\lambda_0(t|x_{it})}\right) = a_r + \sum_{j=1}^{m} b_{r,j} n_{ij} \tag{6}$$

In addition to clinical medicine, more specifically, it extends to cardiovascular disease. The researchers investigated whether arterial pulse wave velocity (aPWV) could improve the temporal prediction of cardiovascular disease. They looked at 17, 635 people with heart problems and collected individual data from 16 studies. Proportional risk models and random effects models assessed the mixed effects and determined the study association between APWV and cardiovascular disease outcomes. They looked at 17, 635 people with heart problems and collected individual data from 16 studies. Proportional risk models and random effects models assessed the mixed effects and determined the study association between APWV and cardiovascular disease outcomes. The researchers conducted a systematic review and used newly published and unpublished cohort data, including APWV and cardiovascular events, to perform an individual participant meta-analysis. Their objective was to determine whether APWV information could improve the prediction of future cardiovascular events in unselected, population-based individuals and patients with significant disease; whether the risk prediction is different among factor groups; whether it improves the risk. The results of this experimental study suggest that AWVP may be a useful biomarker to improve cardiovascular risk prediction in moderate-risk patients.

3 DISCUSSION

3.1 Main Findings

In general, the significance of security prediction for human life and development from three dimensions of security facilities, Internet of things and medicine have been discussed. Some conclusions are found in these three different dimensions.

First, in the security facilities area, some video recognition technology and voice recognition technology can be used to predict what may happen in our daily life, and apply them to the smart city to provide convenience for people's daily life. In the power system, it is also possible to predict the potential dangers in the high-voltage power network through some technologies.

Second, in the IoT prediction area, some of the collected detection and prediction technologies can be applied to the prediction of the Internet of things and use Bayesian theory and some association rules to predict the sequential events and apply them to the Internet of things. For example, the places prone to logistics congestion can be predicted through the logistics records of many users and try our best to avoid these problems in the subsequent logistics routes Lines.

Third, in the field of medicine, some prediction can help doctors to make some reference to the patient's condition, and also can predict some potential threats of patients in some treatment process to help doctors find and predict in time and reduce the occurrence of the risk.

3.2 Limitations and Suggestions for Future Work

On safety detection, event detection from videos cannot be used for all kinds of detection, because the model of it is from a single example, this could limit its ability to summarize the changes of different events (Ke 2007). This paper tries to use this method in the smart city (Wang, et al. 2016), and this method still needs to improve. Besides, the smart city has another problem which is difficult to find the biggest influential equipment when all the objects are moving (Wang, et al. 2016). The errors exist, but they are acceptable at present. Because of that, in the future, there is still more work to do especially on modeling which including auto-selecting events and aggregating multiple training videos into a single model so that this method can get better generalization performance (Ke 2007). The security prediction of a high voltage transmission system can make some objective predictions for the safety of power system facilities, but at present, some chemical elements are still uncontrolled, it can still not predict the influencing factors (Jaya 2019). Therefore, the security problems of the power system from the chemical level or using some chemical methods can be predicted. The wireless acoustic sensors cannot determine the range of relevant thresholds because the noise level of the detected object is unknown, there is a method called the double sliding window algorithm that can fix this problem (Zhong, et al. 2015).

On the IoT prediction, the Bayes theorem can be used to do some IoT predictions. In this paper, research that used association rules is collected to predict sequential events (Rudin, et al. 2011) and researching that predicted events through social stream (Aggarwal 2012). However, all the methods can not 100% sure to predict an event. They are more likely to be reference resources. The IoT needs abundant events because it is dynamic (Karakostas 2016). Besides, some of the events which cannot be observed, their associated events for observation and prediction are needed to find (Rudin, et al. 2011). In the future, when the IoT is more completed, the prediction will be more accurate, but the ability to grab keywords, as well as the accuracy of clustering problems should be improved, to be able to improve the accuracy of prediction problems in the IoT.

In the medical area, there will inevitably be errors in the prediction. For example, there are uncontrollable variables in the process in bio-manufacturing facilities such as the environmental factors (Yang, Farid and Nina 2014). The next problem is the heart problem (Ben-Shlomo, et al. 2014), the age and other diseases can affect the accuracy of the results. The medical facilities can be improved in the future, and computer technology and medical technology should be connected more in the future and make full use of the advantages of computer technology.

4 CONCLUSION

To sum up, this paper has analyzed security events in different fields, including detection and prediction. The paper introduces the relevant safety accidents in different reasonable fields and the learning methods with techniques used to detect the possibility of safety accidents. It mainly summarizes the most general safety accidents in public places, for example, platforms and medical fields, and how to forecast them to avoid errors, meanwhile improving the reliability. The significance of this study focuses on analyzing security and providing efficient solutions. Future research can be strengthened in data selection, universality and adapting the latest prediction technology. Besides, this study might be further applied to more fields to ensure human security, such as information, health and other aspects.

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